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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,460	08/07/2001	Herve Lescuyer	01115	6367

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EXAMINER

MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 03/28/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/856,460

Applicant(s)

LESCUYER ET AL.

Examiner

Krishnan S Menon

Art Unit

1723

-- Th MAILING DATE of this communication appears on the cover sheet with th corr spondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

Claims 1-9 and 11 are pending.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1,2,4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al (US 3,172,757) in view of Rieger et al (US 4,690,763)

Hess teaches a method of filtration for liquid metals comprising passing the liquid metal through a bed of refractory particulate material (col 2 lines 26-54, tables, figures) as in claim 1.

Hess does not teach the porosity of the refractory particles. Rieger teaches the porosity of the hollow refractory particles (see col 2 lines 60-63; col 2 lines 34-48). {Rieger teaches the overall density of the filter bed as about 25% of the ceramic material density (col 2 lines 34-35), which means that the overall porosity is about 75%. Overall porosity includes the space between the particles and the pores within the particles. Of this, about 45% is space between the particles (see

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col 2 lines 40-52, which defines porosity between the spheres as 5-45%). Therefore, the remaining **minus** 30% (75% - 45%) is porosity within the particles.} It would be obvious to one of ordinary skill in the art at the time of invention to have porous refractory particles as taught by Regier in the teaching of Hess for improved wettability and filter capacity (Rieger: col 2 lines 15-21).

Claim 2 adds the further limitation of the residence time as being about 1 to 500 seconds. Hess does not directly teach the residence time. However, Hess teaches flow rate and bed thickness (col 2 lines 26-54, and the table). It would be obvious to one of ordinary skill in the art at the time of invention to calculate and ascertain that the residence time is about 1-500 seconds in Hess from bed thickness and flow rate.

Claims 4 and 6 add further limitations as follows: Bed thickness is between 4 and 40 cm (col 2 lines 26-54) and particle size is between 0.2 and 20 mm (corresponding to mesh size – col 2 lines 26-34) as in claim 4. Liquid metal is selected from aluminum and its alloys as in claim 6 (col 1 lines 15-18).

2. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess (757) in view of Rieger (763) as applied to claim 1 above, and further in view of Brezny (US 5,322,821).

Claim 3 adds the further limitation of porosity being from pores of 10 microns or larger, and claim 11 adds 10-200 microns. Brezny teaches a hollow corundum particles of pore size from 10-200 microns (col 1 lines 53-57). It would be obvious to one of ordinary skill in the art at the time of invention to have a pore size of 10-200 microns as taught by Brezny in the teaching of filter bed particles of Hess in view of Rieger for improved surface area and interconnected porosity for improved capacity of the filter bed (Brezny col 1 lines 26-36).

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3. Claims 5,7,8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess (757) in view of Rieger (763) as applied to claim 1 above, and further in view of Neidhardt et al (US 4,177,235).

Hess teaches material as corundum (col 2 lines 45-50). Hess in view of Rieger teaches fused corundum as in claim 5, which is cast and then granulated as in claim 7 (col 3 lines 37-45).

However, Hess in view of Rieger does not specify electro-fusion for melting corundum, crushing and sieving the particles, etc. Neidhart teaches a process of making electrically fused corundum particles of high purity (see 2 lines 3-43). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhart for making the corundum for the process of Hess in view of Rieger because it would provides the details of making the corundum particles, which is only briefly described by Rieger, to make improved quality corundum particles.

Claim 8 adds the further limitation of particle porosity of 5-30%, which is taught by Hess in view of Rieger, as discussed before in claim 1. Claim 9 adds the further limitation of a device, which Hess teaches (see figures.).

### ***Response to Arguments***

Applicant argues that Rieger reference does not teach electrofused alumina in col 3 lines 37-45. It may be noted that the Rieger reference teaches casting liquid corundum and obtaining hollow spheres in col 3 lines 37-45. It may also be noted that Rieger uses fused corundum. The “electro-fused” only indicate use of an electric furnace for fusing corundum, and the use of electric furnace for fusing corundum is taught by the Neidhart reference.

Applicant argues that Neidhart reference does not teach filtration properties of corundum for liquid metal. It may be noted that Neidhart reference is used to give the details of making

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corundum particles, to support the "known methods" for producing corundum particles, not for supporting the liquid metal filtering properties of corundum.

Rest of applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon  
Patent Examiner  
March 24, 2003

  
W. L. WALKER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700